

**WHAT IS CLAIMED IS:**

1 A cell switch comprising:  
 2 a first switch plane comprising a first switch core;  
 3 a second switch plane comprising a second switch core;  
 4 a sender switch port interface unit;  
 5 a receiver switch port interface unit;  
 6 wherein the sender switch port interface unit sends maintenance cells to the  
 7 receiver switch port interface unit via the first switch plane and the second switch plane,  
 8 the maintenance cells being applied to the first switch plane and the second switch plane  
 9 in a predetermined sequence;  
 10 wherein the receiver switch port interface unit detects an erroneous switch plane  
 11 when the maintenance cells from the sender switch port interface unit do not arrive in  
 12 the predetermined sequence.

1 2. The apparatus of claim 1, wherein the predetermined sequence comprises  
 2 maintenance cells applied to the first switch plane and the second switch plane in  
 3 alternation.

1 3. The apparatus of claim 1, wherein the maintenance cell includes a plane  
 2 indicator which informs the receiver switch port interface unit whether the maintenance  
 3 cell traveled through the first switch plane or the second switch plane.

1 4. The apparatus of claim 1, wherein the sender switch port interface unit sends  
 2 a cycle of maintenance cells to the receiver switch port interface unit, the cycle  
 3 comprising plural sets of the predetermined sequence, and wherein at least a portion of  
 4 the maintenance cell of one of the sets of the cycle is inverted with respect to a  
 5 corresponding portion of the maintenance cell of another of the sets of the cycle.

1 5. The apparatus of claim 4, wherein the cycle comprises two sets of the  
 2 predetermined sequence of maintenance cells.

1        6. The apparatus of claim 1, wherein the receiver switch port interface unit  
2 detects an erroneous switch plane by performing error checking with respect to contents  
3 of a received maintenance cell.

1        7. The apparatus of claim 1, further comprising N number of receiver switch  
2 port interface units, and wherein the sender switch port interface unit applies  
3 maintenance cells to the N number of receiver switch port interface units in a cycle, the  
4 cycle comprising (1) non-inverted maintenance cells sent via the first switch plane to  
5 each of the N number of receiver switch port interface units; (2) non-inverted  
6 maintenance cells sent via the second switch plane to each of the N number of receiver  
7 switch port interface units; (3) inverted maintenance cells sent via the first switch  
8 plane to each of the N number of receiver switch port interface units; and (4) inverted  
9 maintenance cells sent via the second switch plane to each of the N number of receiver  
10 switch port interface units, the inverted maintenance cells having at least a portion  
11 thereof inverted with respect to the corresponding non-inverted cell of the cycle.

1        8. A cell switch comprising:  
2 a switch plane comprising a switch core;  
3 a sender switch port interface unit;  
4 a receiver switch port interface unit;  
5 wherein the sender switch port interface unit sends a pair of maintenance cells to  
6 the receiver switch port interface unit via the switch plane, a first maintenance cell of  
7 the pair having a predetermined portion thereof inverted with respect to a corresponding  
8 portion of a second maintenance cell of the pair.

1        9. The apparatus of claim 8, further comprising a second switch plane through  
2 which the sender switch port interface unit also sends a second pair of maintenance  
3 cells to the receiver switch port interface unit, a first maintenance cell of the second pair  
4 having a predetermined portion thereof inverted with respect to a corresponding portion  
5 of a second maintenance cell of the second pair.

1 10. A cell switch comprising:

2 a first switch plane comprising a first switch core;

3 a second switch plane comprising a second switch core;

4 a sender switch port interface unit;

5 plural receiver switch port interface units, and wherein the sender switch port  
6 interface unit applies maintenance cells to the plural receiver switch port interface units  
7 in a cycle, the cycle comprising (1) non-inverted maintenance cells sent via the first  
8 switch plane to each of the plural receiver switch port interface units; (2) non-inverted  
9 maintenance cells sent via the second switch plane to each of the plural receiver switch  
10 port interface units; (3) inverted maintenance cells sent via the first switch plane to  
11 each of the plural receiver switch port interface units; and (4) inverted maintenance  
12 cells sent via the second switch plane to each of the plural receiver switch port interface  
13 units, the inverted maintenance cells having at least a portion thereof inverted with  
14 respect to the corresponding non-inverted cell of the cycle.

1 11. A method of operating a cell switch comprising:

2 a first switch plane comprising a first switch core;

3 a second switch plane comprising a second switch core;

4 a sender switch port interface unit;

5 a receiver switch port interface unit;

6 a sender switch port interface unit sending maintenance cells to a receiver switch  
7 port interface unit via a first switch plane and a second switch plane, the maintenance  
8 cells being applied to the first switch plane and the second switch plane in a  
9 predetermined sequence;

10 detecting, at the receiver switch port interface unit, an erroneous switch plane  
11 when the maintenance cells from the sender switch port interface unit do not arrive in  
12 the predetermined sequence.

1 12. The method of claim 11, further comprising forming the predetermined  
2 sequence by alternating application of the maintenance cells to the first switch plane  
3 and to the second switch plane.

1 13. The method of claim 11, further comprising including in the maintenance  
2 cell a plane indicator and using the plane indicator at the receiver switch port interface  
3 unit to determine whether the maintenance cell traveled through the first switch plane or  
4 the second switch plane.

1 14. The method of claim 11, further comprising sending a cycle of maintenance  
2 cells to the receiver switch port interface unit, the cycle comprising plural sets of the  
3 predetermined sequence, and wherein at least a portion of the maintenance cell of one  
4 of the sets of the cycle is inverted with respect to a corresponding portion of the  
5 maintenance cell of another of the sets of the cycle.

1 15. The method of claim 14, further comprising forming the cycle with two sets  
2 of the predetermined sequence of maintenance cells.

1 16. The method of claim 11, further comprising detecting at the receiver switch  
2 port interface unit an erroneous switch plane by performing error checking with respect  
3 to contents of a received maintenance cell.

1 17. The method of claim 11, further comprising the sender switch port interface  
2 unit applying maintenance cells to N number of receiver switch port interface units in a  
3 cycle, the cycle comprising (1) non-inverted maintenance cells sent via the first switch  
4 plane to each of the N number of receiver switch port interface units; (2) non-inverted  
5 maintenance cells sent via the second switch plane to each of the N number of receiver  
6 switch port interface units; (3) inverted maintenance cells sent via the first switch  
7 plane to each of the N number of receiver switch port interface units; and (4) inverted  
8 maintenance cells sent via the second switch plane to each of the N number of receiver  
9 switch port interface units, the inverted maintenance cells having at least a portion  
10 thereof inverted with respect to the corresponding non-inverted cell of the cycle.

1 18. A method of operating a cell switch comprising sending a pair of  
2 maintenance cells from a sender switch port interface unit to a receiver switch port  
3 interface unit via a switch plane, a first maintenance cell of the pair having a  
4 predetermined portion thereof inverted with respect to a corresponding portion of a  
5 second maintenance cell of the pair.

1           19. The method of claim 18, further comprising sending a second pair of  
2 maintenance cells via a second switch plane to the receiver switch port interface unit, a  
3 first maintenance cell of the second pair having a predetermined portion thereof  
4 inverted with respect to a corresponding portion of a second maintenance cell of the  
5 second pair.

1           20. A method of operating a cell switch comprising applying maintenance cells  
2 from a sender switch port interface unit to plural receiver switch port interface units in a  
3 cycle, the cycle comprising (1) non-inverted maintenance cells sent via a first switch  
4 plane to each of the plural receiver switch port interface units; (2) non-inverted  
5 maintenance cells sent via a second switch plane to each of the plural receiver switch  
6 port interface units; (3) inverted maintenance cells sent via the first switch plane to  
7 each of the plural receiver switch port interface units; and (4) inverted maintenance  
8 cells sent via the second switch plane to each of the plural receiver switch port interface  
9 units, the inverted maintenance cells having at least a portion thereof inverted with  
10 respect to the corresponding non-inverted cell of the cycle.

